

Claim 40 (first amendment). [The system of claim 30 characterized in that] In a system utilizing a fine grinding wheel, the wheel having a fine grinding surface with an outer extent neighboring an outside circumference,

the improvement of the outer 20-40% of the outer extent of the fine grinding wheel having a convex shape, and  
said convex shape includes at least one step.

Claim 41 (first amendment). [The system of claim 30 characterized in that] In a system utilizing a fine grinding wheel, the wheel having a fine grinding surface with an outer extent neighboring an outside circumference,

the improvement of the outer 20-40% of the outer extent of the fine grinding wheel having a convex shape, and  
said convex shape is a curved shape.

#### REMARKS

In respect to the rejection of claims 2 and 30-41 under 35 USC 112, applicant has amended the term "outside" to "outer" in claim 2 and provided an antecedent for the outer 20-40% in 30 where objected to in order to meet the examiner's indefiniteness rejections in respect to the claims.

In respect to the rejection of claims 13-16, 28 and 29 under 35 USC 102(b), the entire rejection is as follows:

"a. Onodera discloses a dressing wheel system including dressing material having a radial extent less than the radial extent of a fine grinding surface, and means to bring the dressing material and the radial extent of the fine grinding surface into physical contact. The dressing material may dress the fine grinding surface to a convex shape which includes a taper, a step, and/or a curved shape."

"b. Regarding claim 29, as the grinding surface is being dressing, at some point, there will inherently be a flat to convex shape thereto, as broadly recited by applicant."

It is believed that the key to this rejection is the wording that "... the dressing material [of Onodera] may dress the fine grinding surface to a convex shape..." (emphasis added).

Applicant has carefully examined the Onodera patent and has been unable to find any teaching of anything other than a uniform flat shape. In specific as set forth in Onodera, a special dressing unit 50 is used to move two diamond tips 52, 54 radially inward and outward of its grinding wheels 14, 16 to provide a uniform flat shape (fig 1; col 2 lns 50-53; col 4 lns 41-45). This operation begins with the measurements of a set of ten ground substrates, measured both before and after grinding (col 4 lns 59-62; col 5 lns 10-12). If the comparison shows that less than a predetermined amount of substrate has

been ground per period time (col 5 lns 30-37), the dressing unit "automatically" "uniformly" dresses the entire surface of the grinding wheels 14, 16 to a known value (col 5 lns 49-51; col 6 lns 23-25; "incomparably higher precision" see col 5 lns 63-65; col 2 lns 29-32). The upper platen is held in a "predetermined spaced relationship to the lower platen" (col 5 ln 40). The production substrate carriers 20 remain in the device, held in one position so as to not interfere with this dressing operation (col 6 lns 1-5). The sun gear is not driven (col 5 lns 53-57).

In contrast, the presently claimed invention relates to dressing a grinding wheel to provide a convex surface the outer 20-40% thereof (figs 9, 10; pg 8 lns 19-22; pg 5 lns 15-20; pg 10 lns 16-26). In the preferred embodiment, this dressing is provided by replacing the production carriers of a planetary grinding machine (151 in fig 6) with an enlarged intermediate pinion gear and surrounding smaller dresser wheel (121, 125 in figs 1, 2; pg 12 lns 10-14). This locates the dresser wheels at the outer extent of the grinding wheels (pg 12 lns 14-18). The extent of the convex shape produced thereby is adjustable via the relative dresser velocity (pg 12 ln 26-pg 13 ln 10). This shaping of the grinding wheels produces flatter parts in subsequent part production (pg 7 lns 20-22).

The claims 13-16, 28, and 29 rejected under 35 USC 102 recite dressing "the fine grinding surface to a convex shape" (claim 13; claim 29 similar). This recitation is not present in Onodera which is disclosed to be "uniformly" dressed to "incomparably higher precision accuracy" (col 5 lns 51, 63-65).

It is noted that Onodera does disclose the dressing unit inclination adjusting means 60 to "... finely adjust the angle of inclination of the dressing unit 56..." (col 4 lns 45-49). However, this does not modify the references teaching of an automatic and uniform dressing of the grinding wheels (see col 5 lns 40, 51 and 60). Indeed, it is believed that modifying Onodera to produce anything other than a uniform flat surface is against the teachings thereof by purposely varying the surfaces of the grinding wheels from a "known value".

Based on the above, applicant respectfully requests the examiner's reconsideration of the rejection of claims 13-16, 28 and 29 under 35 USC 102(b) as being anticipated by Onodera.

In respect to the examiner's rejection of claim 30 as being anticipated by Caspani or Hornby or Tintelnot, applicant has amended pertinent claim 30 in order to more clearly set forth the preferred embodiment of the invention. This recitation is to additionally recite that the outer extent

extends "from 0-100% of the fine grinding wheel" and that "the outer 20-40% of this outer extent" has a convex shape.

It is believed that this modification places claim, 30 into condition for allowance over the Caspani, Hornby, or Tintelnot, references.

Caspani teaches of a diamond insert carrier which uses an interference fit in order to interconnect the body of the inserts to the carrier. There is no teaching of a convex shape to the outer extent of the fine grinding wheel. At most, it is believed that this reference teaches of a flat surface (depth equal to the abrasive body height; col 4 ln 7, fig 5).

The Hornby reference teaches of a concave surface, at this time a foam buffering pad (col 2 ln 1, figs 2, 3). There is no teaching of a convex shape in this reference.

Tintelnot teaches of an open pored cleaning body having a series of projecting ridges of differing heights (col 1 lns 42-47). The body itself is designed to be moved in a to and fro direction (col 1 ln 64). The surface itself is relatively flat with a uniform surface (col 3 lns 57-58, fig 6).

In none of these references is there a teaching of an outer extent of a fine grinding wheel having a convex shape.

To facilitate allowance of this present application, applicant has placed claims 31-41 into their indicated

condition for allowance. At the same time, to facilitate allowance, applicant has amended claim 30 to clarify the preferred embodiment of a rotary fine grinding wheel. The claim particularly distinguishes over the flat (Caspani) or flexible (Hornby or Tintelnot) surfaces of the cited references.

In that the above is believed to place the application into condition for allowance, favorable action is solicited.

Respectfully submitted,

WILLIAM LIGHTBODY

William S. Lightbody (29,557)

(216) 621-7337 Phone

(216) 621-7393 Facsimile